

In the claims:

1. (Currently Amended) An isolated or recombinant immunogenic polypeptide comprising a *Lawsonia spp.* OmpH polypeptide, ~~a variant, or a truncated variant thereof, wherein said variant or truncated variant mimics or cross reacts with a B-cell or T-cell epitope of *Lawsonia spp.* OmpH Polypeptide~~ set forth in SEQ ID NO: 1.

2. (Currently Amended) The isolated or recombinant immunogenic polypeptide of claim 1 wherein said polypeptide elicits the production of antibodies against *Lawsonia spp.intracellularis* when administered to an avian or porcine animal.

3. (Currently Amended) The isolated or recombinant immunogenic polypeptide of claim 1 which confers a protective immune response against *Lawsonia spp.intracellularis* when administered to an avian or porcine animal.

Claims 4 and 5 (Canceled)

6. (Currently Amended) An isolated or recombinant immunogenic polypeptide comprising:

(i) ~~a peptide, oligopeptide or polypeptide comprising an amino acid sequence, which has at least about 70% sequence identity to the amino acid sequence set forth in SEQ ID NO: 1; or~~

(ii) ~~a homologue or derivative of (i) which mimics a B-cell or T-cell epitope of a *Lawsonia spp.* OmpH polypeptide.~~

7. (Currently Amended) The isolated or recombinant immunogenic polypeptide of claim 6 wherein said polypeptide elicits the production of antibodies against *Lawsonia spp.intracellularis* in a porcine or avian animal.

8. (Currently Amended) The isolated or recombinant immunogenic polypeptide of claim 6 wherein said polypeptide confers a protective immune response against *Lawsonia spp.-intracellularis* in a porcine or avian animal.

Claim 9 (Canceled)

10. (Previously presented) The isolated or recombinant immunogenic polypeptide of claim 9, capable of inducing humoral immunity against *Lawsonia spp.* in a porcine animal.

Claims 11 and 12 (Canceled)

13. (Previously presented) The isolated or recombinant immunogenic polypeptide of claim 6 comprising the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196).

14. (Previously presented) The isolated or recombinant immunogenic polypeptide of claim 13 consisting essentially of the amino acid sequence of SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196).

Claims 15-16 (Canceled)

17. (Currently Amended) A vaccine composition for the prophylaxis or treatment of infection of an animal by *Lawsonia spp.-intracellularis*, said vaccine composition comprising an immunogenic component comprising an isolated or recombinant polypeptide having at least about 70% sequence identity to the amino acid sequence set forth in SEQ ID NO : 1 ~~or an immunogenic homologue, or~~

~~derivative thereof which is immunologically cross-reactive with *Lawsonia intracellularis*~~; and one or more carriers, diluents or adjuvants suitable for veterinary or pharmaceutical use.

Claim 18 (Canceled)

19. (Amended) The vaccine composition according to claim ~~16~~17 wherein the isolated or recombinant polypeptide comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196).

20. (Previously presented) The vaccine composition of claim 19, wherein the isolated or recombinant polypeptide consists essentially of the amino acid sequence of SEQ ID NO: 1.

Claim 21 (Canceled)

22. (Withdrawn) A vaccine vector comprising a polynucleotide that encodes the immunogenic polypeptide of SEQ ID NO: 1, a homologue or variant thereof operably linked to a promoter.

23. (Withdrawn) The vaccine vector of claim 22 wherein the polynucleotide comprises SEQ ID NO: 2 a homologue, or derivative thereof which has at least about 70% sequence identity thereto.

Claim 24 (Withdrawn) The vaccine vector of claim 23 wherein the *Lawsonia* spp. is *L. intracellularis*.

25. (Withdrawn) A polyclonal or monoclonal antibody molecule that binds specifically to a OmpH polypeptide or a derivative of a OmpH polypeptide from

*Lawsonia spp.* wherein said derivative has at least about 70% sequence identity to the amino acid sequence set forth in SEQ ID NO: 1.

Claim 26 (Withdrawn) The antibody molecule of claim 25 wherein the OmpH polypeptide or derivative thereof comprises the amino acid sequence set forth in SEQ ID NO: 1.

27. (Withdrawn) A method of diagnosing infection of a porcine or avian animal by *Lawsonia intracellularis* or a microorganism that is immunologically cross-reactive thereto, said method comprising the steps of: contacting a biological sample derived from said animal with the antibody molecule of claim 25 for a time and under conditions sufficient for an antigen:antibody complex to form, and then detecting said complex formation.

28. (Withdrawn) The method of claim 27 wherein the biological sample is selected from the group consisting of serum, lymph nodes, ileum, caecum, small intestine, large intestine, faeces or a rectal swab derived from a porcine animal.

29. (Withdrawn) A method of identifying a previous or current infection with *Lawsonia intracellularis* or a microorganism that is immunologically cross-reactive thereto, said method comprising:

contacting blood or serum derived from said animal with the immunogenic polypeptide of claim 1 for a time and under conditions sufficient for an antigen: antibody complex to form and then detecting said complex formation.

30. (Withdrawn) An isolated polynucleotide encoding a peptide, oligopeptide or polypeptide selected from the group consisting of:

(i) a peptide, oligopeptide or polypeptide which comprises an amino acid sequence which has at least about 70% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1; and

(iii) a homologue, analogue or derivative of (i) which mimics a B-cell or T cell epitope of *Lawsonia spp* when injected into an animal.

31. (Withdrawn) The isolated polynucleotide of claim 30, wherein the peptide, oligopeptide or polypeptide comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196) or a B-cell epitope or T-cell epitope thereof.

32. (Withdrawn) The isolated polynucleotide of claim 31 comprising SEQ ID NO: 2, a complement or variant thereof.

33. (Withdrawn) The isolated nucleic acid molecule of claim 32 consisting essentially of the nucleotide sequence of SEQ ID NO: 2 or a variant thereof.

34. (Withdrawn) A method of detecting *Lawsonia intracellularis* or *Lawsonia spp* in a biological sample from a porcine or avian animal subject, said method comprising:

hybridizing one or more probes or primers from SEQ ID NO : 2 or a complement thereto to said sample; and detecting said hybridization.

35. (Withdrawn) The method of claim 34 wherein the biological sample is selected from the group consisting of: serum, lymph nodes, ileum, caecum, small intestine, large intestine, faeces or a rectal swab derived from a porcine animal.

36. (Withdrawn) The method of claim 34 wherein the detection is by any nucleic acid based hybridization or amplification reaction.

37. (Withdrawn) A probe or primer having at least about 15 contiguous nucleotides from SEQ ID NO: 2 or the complement thereof.

38. (Withdrawn) A plasmid pALK13 (ATCC Accession No. 207196).

Claim 39 (Canceled)